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MISCELLANEOUS INSECT ENEMIES OF SOUTHERN PINES^{1/}

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This number of the SOUTHERN FOREST PEST REPORTER brings together information on the identification, habits, and control of some miscellaneous insect enemies of southern pines. It complements the tenth number of the REPORTER, which described major pine insects of the South.

Several of the insects discussed here attack pine trees and other conifers infrequently or to such a slight degree that they are usually not considered serious. Occasionally, they may build up large populations in very limited areas or on individual trees, and control measures may become necessary. It is also possible that some so-called minor pests may become important enemies of southern pines in the future. The black turpentine beetle, for example, now an important forest insect, was once of minor significance. Conversely, the turpentine borer, which was formerly a major pest, is now considered minor.

^{1/} Published and unpublished information accumulated by entomologists formerly or presently employed by the Southern Forest Experiment Station has been drawn upon freely in compiling this publication.

CAUTION!

KEEP INSECTICIDES OFF THE SKIN AND AWAY FROM EYES AND NOSE. WASH CAREFULLY WITH SOAP AND WARM WATER AFTER MIXING OR APPLYING SPRAYS OR DUSTS, AND AVOID WEARING CONTAMINATED CLOTHING. OBSERVE THE INSTRUCTIONS ON THE LABELS OF THE CONTAINERS.

Table 1. --Minor pine insects of the South

Insect	Importance	Symptoms
<u>Southern Pine Sawyer</u> Round-headed borer tunnels in dead and dying trees and fresh-cut logs.	The tunnels cause severe defects in lumber sawn from infested logs. Especially destructive following wildfire, blow-downs, and bark-beetle outbreaks. Also attacks logs left in the woods during the summer.	Pencil-size and larger holes in sapwood and heartwood, with coarse excelsior-like frass. Funnel-shaped holes in bark where eggs have been desposited.
<u>Turpentine Borer</u> Flat-headed borer in fire-scarred and turpented trees.	Degrades lumber and weakens stems so that they may break during wind or ice storms.	Elliptical emergence holes on fire scars and particularly in turpentine faces. Larval tunnels filled with tightly packed fine frass and resin. Trees broken off about breast high during high winds.
<u>Ambrosia Beetles</u> Pin-hole borers in dying trees, logs, and unseasoned lumber.	Make small holes in the wood and introduce a dark stain.	Pin-hole damage and black stain in lumber. Piles of fluffy white boring dust on ground and in bark crevices of infested trees and logs.
<u>Pine Webworm</u> Defoliates seedlings in nurseries and young plantations.	When infestations are severe, young stock may die.	Seedlings have masses of silk webbing mixed with excrement pellets.
<u>Pine Colaspis Beetle</u> Feeds on needles of natural and planted reproduction and larger trees.	Produce conspicuous browning but generally of little significance.	Needles appear as if singed by fire and are highly reflective at night. Symptoms most noticeable in June and July.
<u>Pine Needle Miner</u> Burrows and feeds within needles.	Probably causes growth loss.	Conspicuous browning and yellowing of needles. Partly hollowed needles with excrement particles and minute holes.
<u>Pine Pitch Midge</u> Attacks twigs and lives in glob of resin.	Common but of little economic importance.	Small masses of semi-fluid resin containing yellowish-orange larvae with occasional swelling of plant tissue. Twigs sometimes swell under the pitch glob.
<u>Scale Insects</u> Suck sap from needles and twigs.	Occasionally become very numerous, reducing tree vigor and killing young pines.	Scale-like insects covering needles or twigs. Fading or browning foliage in severe infestation with honeydew present.
<u>Aphids</u> Suck sap from needles, bark, roots.	Cause growth loss and malformation of infested parts.	Soft-bodied plant lice on foliage or bark. Honeydew present.
<u>Spider Mites</u> Suck sap from needles and twigs.	Sometimes kill ornamental conifers.	Spotty, pale-green and brown foliage. Fine webbing with cast skins and eggs or mites on needles or twigs.

SOUTHERN PINE SAWYER

Monochamus titillator

Importance. -- Larvae of the southern pine sawyer tunnel through the sapwood and heartwood of green logs and dead or dying pines, degrading the lumber and opening the way for decay fungi. The insect is particularly destructive to windthrown and fire-killed timber and to logs left in the woods or held in storage during the warm months.

Habits. -- The larvae are legless, somewhat flattened white grubs up to two inches long. The thoracic or front segments of the body are slightly wider than the abdominal segments (fig. 1). The beetle is mottled greyish-brown, 3/4 to 1-1/4 inches long. The antennae are sometimes two or three times as long as the body.

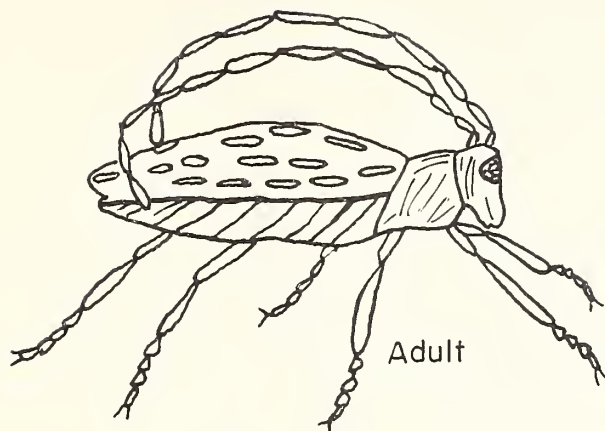
The female beetles cut funnel-shaped pits in the bark surface and deposit eggs in the phloem. Upon hatching, the larvae feed in the cambium and sapwood and later tunnel deep into the sapwood and heartwood. Eventually they return almost to the surface and construct a pupal cell. Following transformation, the adults chew a hole to the surface and emerge. Two or three generations a year are produced in the South.

Signs of attack. -- The earliest signs of attack are the funnel-shaped egg niches in the bark. Beneath the bark, dense, brownish frass and coarse-shredded, excelsior-like wood shavings are present. Circular pencil-size holes in the wood and bark are a sign that adults have emerged.

Control. -- Rapid salvage and utilization of dead and dying trees or green logs will reduce losses. If the beetle populations are large and logs must be stored, damage may be prevented by promptly spraying the bark with benzene hexachloride (BHC) in fuel oil.

The recommended spray is prepared by stirring one gallon of BHC concentrate (containing one pound of gamma isomer per gallon) into 49 gallons of No. 2 fuel oil. The finished spray costs approximately 20 cents per gallon. The concentrate can be purchased in 1, 5, and 55-gallon containers.

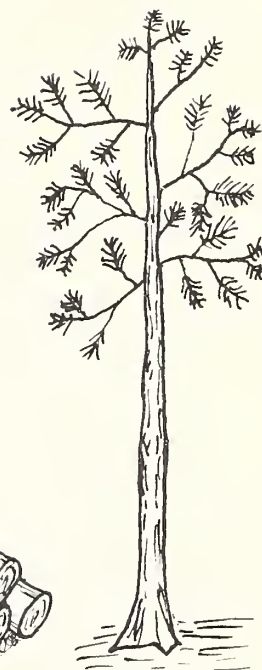
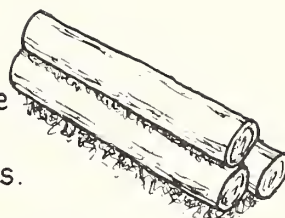
One gallon of the finished spray will treat about 100 square feet of bark surface. All surfaces should be covered thoroughly--until drops begin to form and run off. Logs should be turned so that the under sides can be sprayed.



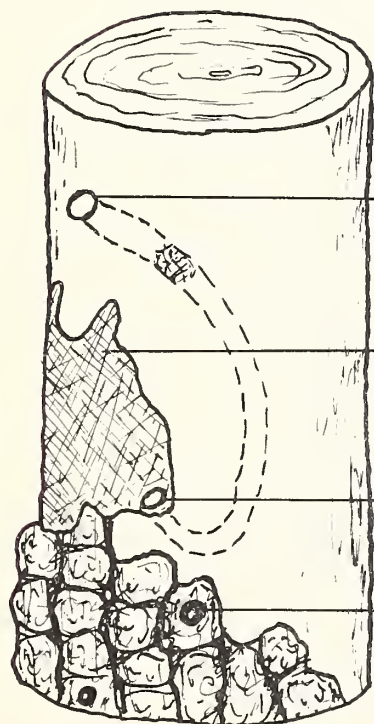
Adult

Actual size

Excelsior-like
frass under
infested logs.



Attack dead or dying
trees and green logs.



Round pencil-
size hole.

Irregular gouging on
surface of sapwood
& coarse excelsior-
like wood shavings.

Oval hole made
by larva as it
enters wood.

Funnel-shaped egg-
niche in outer bark.



Actual
size

Larva

Fig. 1.— Southern pine sawyer.

TURPENTINE BORER

Buprestis apricans

Importance. -- Larvae of the turpentine borer attack the basal portion of pines that have been turpented, fire-scarred, or injured mechanically. Larval boring may weaken the trees so that they break off in windstorms. When infestations are severe, 3 to 6 feet of the butt log may become unfit for lumber. Sound, healthy trees are seldom attacked.

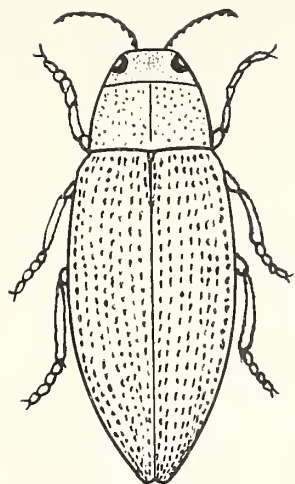
Habits. -- The legless larvae are elongated white grubs up to 1-1/2 inches long. They appear flat-headed because the thoracic or front segments of the body are distinctly wider than the abdominal segments (fig. 2). The beetle is grayish-bronze with a greenish metallic luster, 1-1/4 inches long.

The female lays eggs in checks in drywood of turpented trees or trees that have been fire-scarred or otherwise injured. The larvae mine extensively in the sapwood and heartwood. The life cycle is completed in approximately 3-1/2 years.

Signs of attack. -- Often the earliest signs of this beetle are elliptical emergence holes in dry turpentine faces or fire scars, or tunnels in trees broken off by wind. When infested trees are sawn into lumber, larval tunnels filled with fine, tightly-packed boring dust and resin are exposed.

Control. -- The turpentine borer has been a major pest in the naval stores region. However, although many worked-out trees still remain in the forest as breeding places for this insect, modern naval stores practices, and particularly the prompt harvest of worked-out trees, have virtually eliminated severe infestations. Prescribed burning to decrease wildfire hazards and to reduce the number of charred, cracked faces on trees worked for naval stores has also helped.

Occasionally, tree trunks will require spraying to protect them, and the recommended spray is BHC in No. 2 fuel oil. It is prepared by stirring two gallons of BHC concentrate (containing one pound of gamma isomer per gallon) into 48 gallons of the fuel oil. The finished spray costs approximately 24 cents per gallon. One gallon of the finished spray will treat about 100 square feet of surface. All surfaces subject to attack should be covered thoroughly--until drops begin to form and run off.



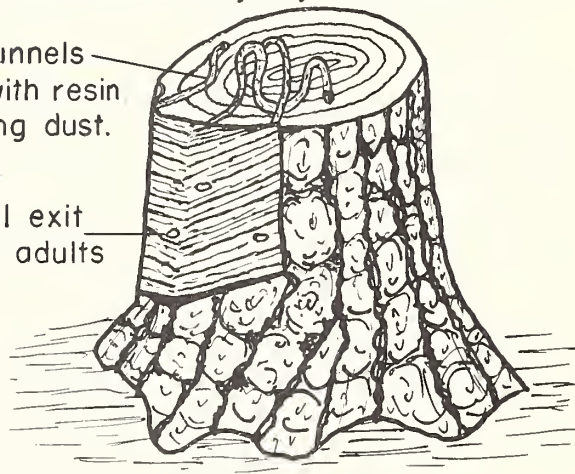
Adult

Actual
size

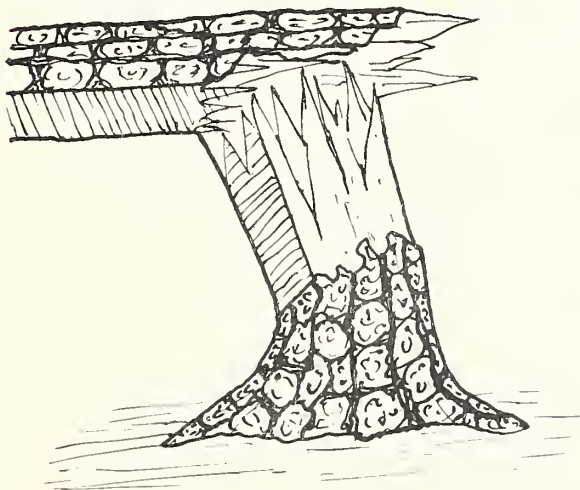
Attack turpented, fire-scarred,
or mechanically injured trees.

Larval tunnels
packed with resin
and boring dust.

Elliptical exit
holes of adults



Larval feeding may
weaken tree enough
to cause wind breakage.



Larva

Actual
size

Fig. 2.—Turpentine borer.

AMBROSIA BEETLES

Platypus spp.

Importance. -- Ambrosia beetles of the Platypus group attack weakened, dying, or freshly cut pines and unseasoned pine lumber. They degrade the wood by boring small holes and introducing a black stain.

Habits. -- The adults are reddish-brown, elongated beetles, approximately 1/4 inch in length (fig. 3). They bore into the sapwood and heartwood of logs or lumber, making pin-size holes that usually are darkly stained by an ambrosia fungus upon which the adults and larvae feed. The female lays eggs in small clusters in the tunnel, and the developing larvae excavate small cells extending from the tunnel parallel with the grain of the wood. There are several generations each year.

Signs of attack. -- Small piles of yellowish-white fluffy boring dust accumulate around the base or in bark crevices of infested trees, stumps, and logs. In lumber the characteristic pin-size holes surrounded by black stain may be observed extending into the wood.

Control. -- Prompt utilization of dead and dying trees and rapid seasoning of lumber will reduce or eliminate losses. Where these courses are impractical, green logs may be protected for several months by spraying with BHC in No. 2 fuel oil, mixed in the same proportion as recommended for the turpentine borer.

Green lumber may be protected by dipping it in a water emulsion prepared by mixing two quarts of BHC emulsifiable concentrate (containing one pound of the gamma isomer per gallon) with 50 gallons of water.

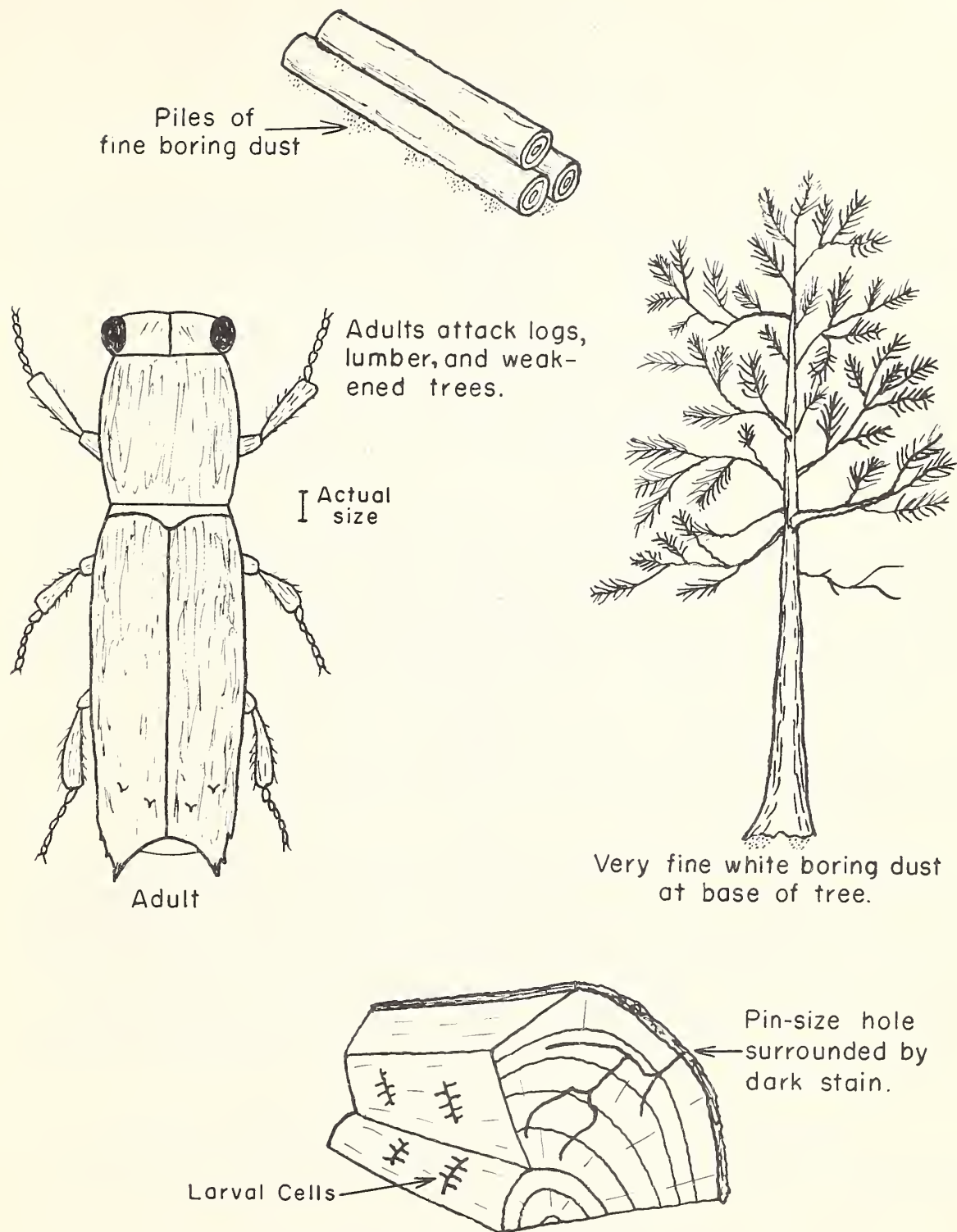


Fig. 3.— Ambrosia beetle.

PINE WEBWORM

Tetralopha robustella

Importance. -- Infestations of pine webworms are usually light and scattered, but sometimes young pines in nurseries and plantations are defoliated and killed.

Habits. -- The full-size larva is a caterpillar approximately 4/5-inch long. The head is tan with darker markings, and the body light brown with dark longitudinal stripes on each side (fig. 4). The adult is a moth with a wingspread of approximately one inch. The forewing usually is grey in the middle portion and darker at the base and tip.

Eggs are laid on seedlings or small trees between May and September. The caterpillars live in silken webs surrounded by masses of excrement pellets. They feed on the needles. Normally each web contains one or two larvae, but occasionally twenty-five or more may be found. After it completes feeding, the caterpillar drops to the ground and makes an oval pupal cell slightly below the soil surface. Generally, two generations are produced each year in the South.

Signs of attack. -- Defoliation and masses of silk webbing surrounding pellets of excrement are the most common signs of attack. Occasionally dead defoliated seedlings may be present.

Control. -- When populations are high or when valuable nursery stock becomes infested, chemical control may be necessary. Mix 50 percent DDT wettable powder in water at the rate of 1 pound of powder to 25 gallons of water, and thoroughly spray all infested foliage. The mixture must be constantly agitated to prevent the DDT from settling out. The finished spray costs approximately 2 cents per gallon. Fifty percent DDT wettable powder can be purchased in 4-pound and 50-pound containers.

As DDT may aggravate mite troubles it is well to include a miticide or to watch seedlings and be ready to spray if mites become a problem.

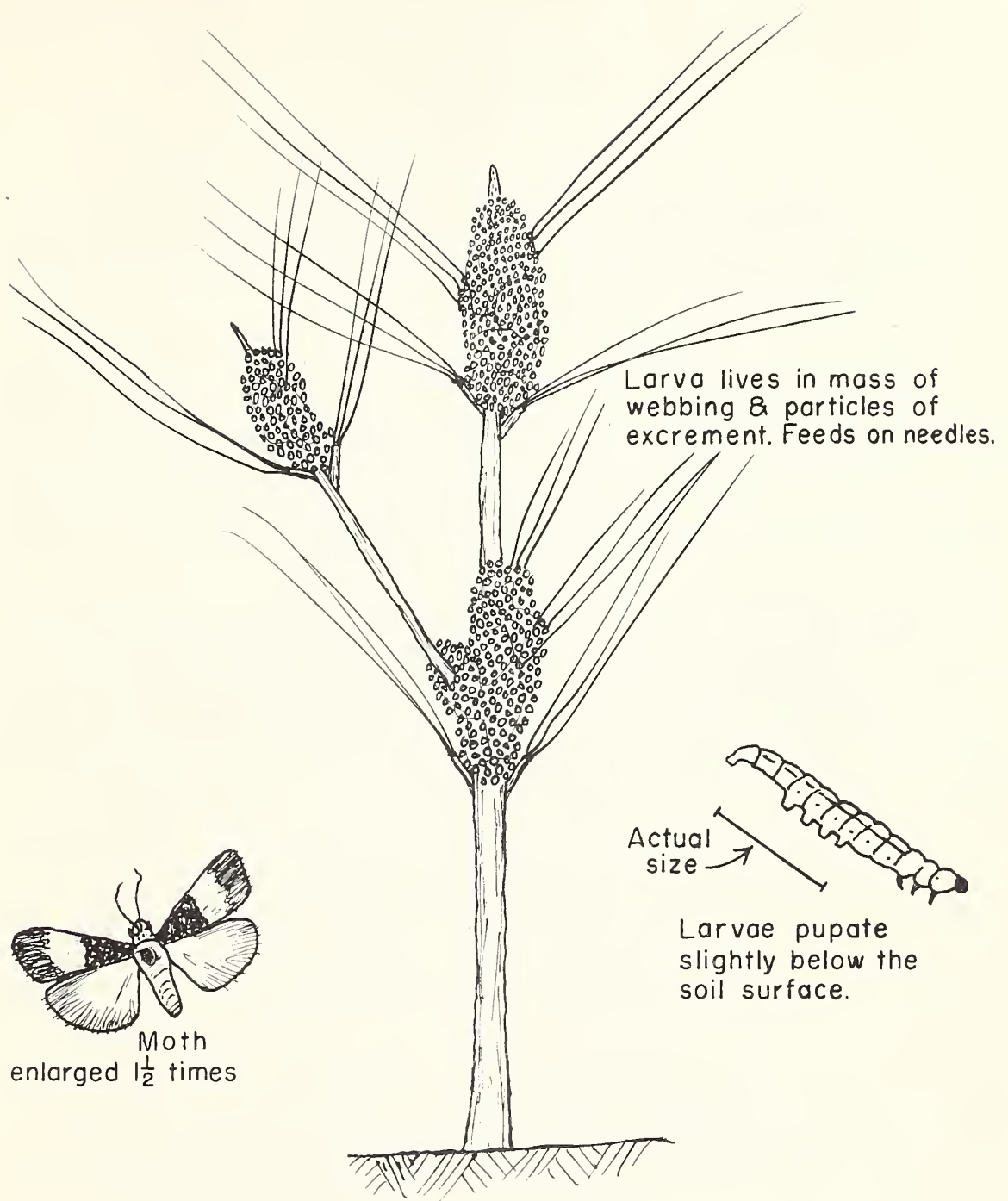


Fig. 4— Pine Webworm.

PINE COLASPIS BEETLE

Colaspis pini

Importance. --Feeding by the pine colaspis beetle produces a spectacular browning of the needles similar to that caused by fire. The beetle is not known to kill pines and apparently has slight effect on their growth. Infestations occur sporadically throughout the South.

Habits. --The beetles are oval-shaped, one-fourth inch long, with brown stripes and minute greenish jewel-like specks over the body. From May to early July they feed on the one-year-old needles of young pines and occasionally on needles of larger trees. At times several hundred acres of natural and planted saplings may be attacked, but infestations usually are spotty, with the affected trees occurring singly or in groups throughout the area. One generation is produced each year.

Signs of attack. --The earliest evidence of attack is the presence of small drops of resin on the needles. At night the resin drops are highly reflective and appear to be luminescent when a light is flashed on them. The foliage later becomes discolored, and an examination will reveal irregular saw-like edges along the needles, particularly those in the upper half of the crown. By late summer new growth again makes the trees look normal.

Control. --Colaspis beetles may reach alarming populations in an area one year and then appear elsewhere the next. Chemical control usually is not justified in the forests, but ornamental trees can readily be protected with a DDT spray. The spray should be applied when the first symptoms of beetle activity appear in late May or early June.

To prepare the spray, stir one pound of 50 percent DDT wettable powder into 50 gallons of water, and keep the mixture well agitated while it is being applied. The finished spray costs approximately 1 cent per gallon. Fifty percent DDT wettable powder can be purchased in 4-pound and 50-pound containers. A 10 percent DDT dust may be used instead of the spray.

DDT may aggravate mite troubles. It is advisable to include a miticide or to watch foliage and be ready to spray if mites become a problem.

OTHER PINE INSECTS

Pine needle miner (Exoteleia sp.). -- The larvae burrow into the needles of longleaf and other pines, leaving the outer part of the needles dead and semi-transparent. When infested trees are observed from a distance, the foliage looks brown or yellow. The larvae are light brown with black heads and are approximately 3/16-inch long. The adult is a brownish-yellow moth with silvery scales. Damage to pines is presently considered of minor importance, although some growth loss may be expected.

Pine pitch midge (Retinodiplosis sp.). -- The midge is a delicate fly usually less than 1/4-inch in length. The orange, legless larvae occur singly or in groups in small globs of resin exuding from swellings on branches or twigs of pines. In some years they are common and some twigs may be killed. They probably cause little damage, however.

Scale insects (Coccidae). -- Scales are soft, waxy insects that suck sap from plant tissues. The adult females hardly resemble insects, as they are scale-like and do not move. The newly hatched young are microscopic and are known as crawlers. They move about over the needles and twigs.

The pine needle scale (Phenacaspis) is a white, elongate scale about 1/8-inch in length. It occurs on the needles. The pine bark scale (Toumeyella) is a brown species about the size of a pea, and usually occurs in crowded masses on the twigs and branches.

Heavily infested pines become pale-green or yellow and covered with a sticky "honeydew" excreted by the insects. A black, sooty mold often grows over the honeydew and increases the unsightliness of the foliage. Occasionally small plantation trees are killed.

Control is generally not recommended under forest conditions. On ornamental pines, scales may be destroyed by spraying with malathion, following directions of the manufacturer. The spray is most effective when the insects are in the crawler stage.

Aphids (Aphidae). -- Aphids or plant lice are light green or brown soft-bodied insects, varying in size from 1/16- to 1/4-inch. Both winged and wingless forms occur. The aphids suck sap from the needles, bark, and sometimes the roots. Usually infestations attract attention because of the dropping of sticky honeydew as the aphids feed. Very little is known of the overall effects on forest trees by large and frequent aphid

populations. Undoubtedly they cause growth loss and some malformation of infested parts.

Chemical control is generally unnecessary or impractical under forest conditions. Where shade trees and ornamental pines are heavily infested, a spray of 25 percent malathion emulsifiable concentrate diluted at the rate of one pint per 100 gallons of water will be satisfactory.

Spider mites (Tetranychidae). --Mites are not insects but animals related to ticks and spiders. There are many species.

Mites are among the most persistent of plant-feeding pests; they cause foliage to fade and later turn brown. Damage is most severe during hot, dry weather. When infestations are heavy, mites can be found all over the needles and twigs, running over the fine webbing they spin. Though they are very small, their presence may be easily determined by jarring them off the foliage onto a sheet of white paper. If living mites are absent, their cast skins, egg shells, and webbing usually can be found on infested plants.

Infested pines growing under forest conditions may appear rusty brown, but usually recover following soaking rains. Mites may be removed from ornamental trees or shrubs by thoroughly and repeatedly washing the plants with a strong stream of water. Several of the newer chemicals used in mite control are malathion, aramite, kelthane, and DN-111.

